# A SANITARY SURVEY OF BYNG INLET

## TOWNSHIP OF WALLBRIDGE

August 1978



Ministry of the Environment
Ontario

The Honourable
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Minister

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## TABLE OF CONTENTS

## I. SUMMARY

A sanitary survey carried out in the community of Byng Inlet during the months of July and August of 1977 detected that many of the inhabitants were obtaining a drinking water with bacterial levels above this Ministry's permissible microbiological criteria for untreated ground water supplies. Bacteriological examination of the samples submitted revealed that approximately 75% of the drinking water supplies were contaminated.

Phenols were also detected in all of the samples submitted for chemical analysis and attributed to decaying waste wood from previous lumbering activities.

The survey also revealed that 80% of the sewage disposal systems were seriously substandard.

The residents have been informed by letter of the results of the bacteriological examination of their drinking water supplies. They have also received information on how to chlorinate their water with chlorine bleach. (see Appendix No. III)

## II. INTRODUCTION

During the months of July and August 1977, a sanitary survey was conducted in the community of Byng Inlet in order to determine the quality of the drinking water supplies in the community, document the extent of the pollution in the water supply, and make recommendations as to how the quality of the water could be improved.

Sewage systems were observed and documented and conclusions drawn as to the extent of the contamination of the drinking water caused by inadequate sewage facilities.

## III. LOCATION

Byng Inlet is located on the Magnetawan River approximately five kilometers from where the river empties into Georgian Bay, seventy kilometers north of Parry Sound.

## IV. DESCRIPTION

The village of Byng Inlet was originally settled in the 1870's and 1880's as a centre for lumbering activites. The largest lumber company operating out of the village at that time, Graven Bigwood, allowed its employees to contruct their houses on the company's property without purchasing the land. For this reason the settlement is scattered with groups of houses located in areas where the terrain permitted easy access. The area is now a registered plan and residents either own their own lots, or they are tenants of a Mr. A. Horobetz, a local resident, who owns much of the land in Byng Inlet.

The current population of Byng Inlet is 150, of which 50 are seasonal residents. Many of the people are supported by Government allowances, while others support themselves by trapping in the winter and fishing or acting as guides during the summer months. A few of the residents are employed by Texaco Canada Limited, and work at the company's facilities which consist of an oil and gasoline storage yard and a shipping dock which is located approximately three kilometers west of the community.

## V. TOPOGRAPHY

The topography of Byng Inlet is rough and is dominated by outcroppings of Pre-cambrian Shield. The landscape rises to the south, thus directing drainage towards the Magnetawan River. The overburden, where it exists, primarily consists of clay or sandy clay to various depths up to approximately 4 meters.

## VI. DRINKING WATER

The majority of the residents of Byng Inlet obtain their water from individual dug wells. Many of the wells are stone lined and over twenty years of age. Other residents obtain their drinking water from drilled wells, while still others carry their drinking water from the river. None of the private water supplies are treated. Most of the dug wells are bailed out and scrubbed down with chlorine bleach or chloride of lime once

a year. Many residents add bleach to the wells after this cleaning, although none treat the water regularly.

## VII. SEWAGE DISPOSAL

Sewage disposal systems used by the residents of Byng Inlet range from dilapidated outdoor privies to chemical toilets, modern propane and humus producing toilets and subsurface sewage disposal systems that were approved by the Health Unit a number of years ago.

The most common system encountered in the survey was the outdoor privy. Many of these were very old and of poor repair. Quite often they were built directly on top of the bedrock outcropping or above pits that were dug through impermeable soil to bedrock.

Those residents using chemical systems often dispose of their chemical wastes onto the ground surface or in shallow pits.

Much of the wash water used by the residents is either thrown or drained out onto the surface of the ground. In a few instances, wash wastes are drained into leaching pits consisting of sand and gravel. It was also observed that the majority of the residents who had septic tank and tile bed systems still drain their wash water onto the ground.

Of the fifty-one inspections made during the survey, only ten sewage systems including the humus and propane toilets could be considered adequate.

## VIII. WASTE DISPOSAL

The inhabitants of Byng Inlet and surrounding area dispose of their garbage at a Ministry of Natural Resources' dumpsite located three kilometers east of the village along Highway 645. The refuse is burned and covered twice a month by Natural Resources staff. Due to the relatively small area of usable land at the site, it is estimated that the dump will be full in

two or three years. The Ministry of Natural Resources is presently looking for a suitable area in which to establish another site.

## IX. PROCEDURE

Bacteriological and chemical samples were collected from July 14, 1977 to August 15, 1977. Samples were refrigerated immediately after they were taken and shipped by courier in ice filled coolers to the Ministry of the Environment laboratory in Toronto. When initial examination of the bacteriological samples for background colonies and total coliforms demonstrated a high concentration of bacteria, further samples were taken and shippedby the same method to the Regional Ministry of Health laboratory in Orillia where they were examined for faecal coliforms.

Samples were taken from the drinking water supply of each household in Byng Inlet and at several points along the Magnetawan River where residents obtain their drinking water.

Chemical analyses were performed on all communal supplies that serviced more than two households and where there were evident problems with the water supply. Map No. 1 indicates where bacteriological and chemical samples were taken along the river.

Each of the residents was notified by letter, of the results of the bacteriological examination of their drinking water. Suggestions on how to produce safe water were also sent with each letter. A sample of the letter and information have been appended to the report.

## X. SAMPLE RESULTS AND INTERPRETATION

(A) Bacteriological Results (For Explanation of Terminology see Appendix I)

During the survey over sixty samples were taken for bacteriological examination. Of these samples, fewer than 25% of the

results revealed water that was suitable for drinking. When the initial examination demonstrated a concentration of bacteria, further examinations were carried out for faecal coliforms. These tests generally indicated faecal coliform concentrations above this Ministry's acceptable limit for domestic water supplies. The complete analysis results have been included in the report as Data Table No. 1.

Samples taken at points along the Magnetawan River also displayed high concentrations of background colonies, total and faecal coliform. (See Data Table No. 2)

The high concentration of coliform bacteria could be a result of poor construction and location of wells in combination with the surrounding topography and inadequate sewage disposal facilities. Many of the wells were located in drainage patterns down gradient from sewage disposal systems. Their stone construction and the dilapidated state of the well covers could allow infiltration of contaminated surface water and other undesirable matter.

(B) Chemical Results (For Explanation of Terminology, see Appendix II)

During the survey, samples were taken for chemical analysis from the Magnetawan River and from communal wells that served more than two households. A chemical analysis was also carried out on water supplies that warranted more than bacteriological assessment due to observations of turbidity, taste, or odour.

Results from analysis for phosphorus generally depicted concentrations within acceptable levels, although one sample exhibited concentrations substantially higher than acceptable levels. Excessive phorphorus levels would be an indication that laundry wastes or domestic sewage were infiltrating the ground water supply, since many of the residents dispose of their wash water directly onto the surface of the ground.

pH levels ranged between 6.2 and 8.3, with higher values being exhibited from samples taken from drilled wells.

The iron levels of the drinking water were generally acceptable with the exception of two dug wells where the iron content was found to be far above the acceptable limit of 0.3 mg/litre.

All chloride concentrations determined in the survey were below acceptable limits. Chloride concentrations above the desired criterion of 25 mg/litre were detected in wells where chlorine bleach had been used as a disinfectant. These concentrations, however, were well within the permissible criterion of 250 mg/litre.

River sample results generally exhibited insignificant concentration of the chemical parameters used in the study and levels of alkalinity, hardness, conductivity and the pH fell within acceptable limits. The complete analysis results have been included in the report as Data Table No. 3.

Phenol levels recorded in the study were all above the maximum accepted level of 1mg/litre. Concentrations of phenols above the accepted limit will impart a taste and odour problem in the water supply, especially if the water is chlorinated. The phenol content in some of the well water supplies may be due to decaying or distilling wood. As noted earlier, Byng Inlet was, in the early 1900's, a centre for timber works. Reportedly, large amounts of sawdust and woodchips were used to fill in lowlying areas. Many of the wells currently in use have been dug in the vicinity of these filled areas.

A total of 12 phenol samples were taken from the river. (see Figure I for sample locations). The results indicate a presence of phenols in relatively high concentrations in all of the samples taken. It is important to note that phenol concentrations in the samples taken upstream from the community were the same level as the samples taken in the vicinity of the docking facilities; therefore, the presence of phenols exhibited in the samples cannot be attributed to the presence of oil tankers that frequent the area, even though many of those interviewed complained of seeing oil slicks whenever the ships came into port.

FIGURE 1 - PHENOL SAMPLING POINTS

It would appear that the elevated phenol concentrations in the river area are a natural occurrence.

The complete analysis results have been included in the report as Data Table No. 4.

## XI. RECOMMENDATIONS

i) The residents of Byng Inlet should be encouraged to develop sewage disposal facilities best suited to the topography and their financial position. Outdoor privies and leaching pits should be of proper repair and located in suitable locations. Those residents presently throwing their wash wastes onto the surface of the ground should be required to install leaching pits. Information on alternate sewage disposal facilities such as propane and electrical toilets should be given to the residents.

ii) Those residents owning wells that displayed an unacceptable quality of water caused by the infiltration of contaminants due to improper location or construction of their wells should be persuaded to either upgrade or relocate their wells. In some cases, due to the size and other limiting condition of some lots, a properly installed drilled well may be the only remedy to ensuring a safe water supply.

iii) The residents should also be encouraged to monitor the activities of the oil tankers on the Magnetawan River and inform this Ministry should they observe any oil spillage or notice any of the ships pumping their bilge water into the river.

APPENDIX NO. 1

## TABLE NO. 1

## BACTERIOLOGICAL SAMPLE RESULTS OF WATER SUPPLIES

| Sample No. | Name | Date | Background Colonies counts/100 ml | Total Coliforms counts/100 ml | Faecal Coliforms counts/100 ml |
|---|---|---|---|---|---|
| 1 (a) | P. Barsky | July 14 | 56,000 | 9,900 | -- |
| (b) | | July 26 | 162,000 | 22,400 | 10 |
| 2 | N.Davidson | July 14 | 29 | 0 | -- |
| 3 | Abandoned Trailer -- No Sample Taken -- | | | | |
| 4 (a) | W. Lacroix | July 14 | 1,500 | 59 | -- |
| (b) | | Aug. 3 | 25,000 | 110 | 20 |
| 5 (a) | R. Rivard | July 14 | 350 | 35 | -- |
| (b) | | July 19 | 1,200 | 11 | -- |
| (c) | | July 27 | -- | 0 | 0 |
| 6 | Lacroix | July 14 | 1,500 | 59 | -- |
| 7 | E. Lamonday | July 20 | 2,100 | 0 | -- |
| 8 | H. Secord | July 20 | 2,100 | 0 | -- |
| 9 (a) | M. Lamoure | July 14 | 9,000 | 1,200 | -- |
| (b) | | July 26 | 7,800 | 1,600 | 92 |
| (c) | | July 26 | | 80+ | 80+ |
| (d) | Chlorine added | Aug.3 | 3 | 2 | -- |
| 10 | V.Lamoure | July 14 | 6,200 | 2,000 | -- |
| | | July 26 | | 18 | 4 |
| | | July 26 | 460 | 20 | 8 |
| | | Aug. 3 | 48,000 | 19 | -- |
| 11 | F. Lamoure | July 26 | 820 | 16 | <2 |
| 12 | C.W Schweig | July 19 | 2,500 | 37 | -- |

Table No. 1, Cont.

| Sample No. | Name | Date | Background Colonies counts/100 ml | Total Coliforms counts/100 ml | Faecal Coliforms counts/100 ml |
|---|---|---|---|---|---|
| 13 (a) | S.Boucher | July 14 | 16,300 | 100 | -- |
| (b) | | July 26 | 41 | 22 | <2 |
| 14 | W.Rivard | July 14 | 800 | 15 | -- |
| 15 | R.Bushey | July 14 | 460 | 3 | -- |
| 16 | G.Giroux | see Sample forty-nine (49) | | | |
| 17 | E. McLaughlin | see Sample forty-nine (49) | | | |
| 18 | J.Mallette | July 15 | 1,900 | 900 | -- |
| 19 | G. Lamonday | July 26 | 0 | 0 | 0 |
| 20 | D. Bushey | July 14 | 173 | 240 | -- |
| | | July 26 | 11,000 | 1300 | -- |
| 21 (a) | E. Brebant | July 19 | 7,000 | 0 | -- |
| (b) | | Aug. 3 | 8 | 0 | 0 |
| 22 | M. Currey | No Sample Taken | | | |
| 23 | N. Secord | July 19 | 11,000 | 3,100 | -- |
| | | Aug. 15 | -- | 80+ | 80+ |
| 24 | L. Lamoure | July 19 | 580 | 31 | -- |
| 25 | A. Monday | | 292 | 138 | |
| 26 | B. St.Amant | Aug. 3 | 120,000 | 9,000 | 2800 |
| | | Aug. 15 | -- | 80+ | 26 |
| 27 | J.P.Doucette | Aug. 3. | 2,200 | 0 | -- |
| | | July 27 | -- | 0 | 0 |
| 28 | A. Schweig | No Sample Taken | | | |

Table No. 1, Cont.

| Sample No. | Name | Date | Background Colonies counts/100 ml | Total Coliforms counts/100 ml | Faecal Coliforms counts/100 ml |
|---|---|---|---|---|---|
| 29 | J.Lamondin | July 20 | 2,100 | 0 | 0 |
| 30 | R.Karwaski | July 20 | 77 | 0 | 0 |
| 31 | J.Lamour | July 20 | 110 | 0 | -- |
| | | Aug. 3 | 52 | 0 | 0 |
| 32 | F.Lavalley | July 20 | 110 | 0 | -- |
| 33 | M. Smyth (Direct from River) | July 20 | | 38 | -- |
| 34 | Raiche | July 20 | 448 | 64 | -- |
| 35 | J. Raiche (Direct from River) | July 20 | 800 | 29 | -- |
| 36 | Derochie | July 20 | 448 | 64 | -- |
| 37 | I.Lamour | July 20 | 292 | 138 | -- |
| 38 | L.Lamour | July 20 | 292 | 138 | -- |
| 39 | S. Posie | July 20 | 66 | 6 | |
| 40 | A. Massicote | July 20 | 520 | 112 | |
| 41 | H. Read | July 26 | 3,900 | 3,200 | 26 |
| | | | -- | 40 | 40 |
| | | Aug. 3 | 90,000 | 7,800 | 88 |
| 42 | N. Fletcher | July 21 | 13 | 0 | -- |
| 43 | H.Boucher | July 21 | 292 | 138 | |
| 44 | R.Deshevy | July 21 | 20 | 11 | -- |
| | | Aug. 3 | 0 | 0 | 0 |

Table No. 1 Cont.

| Sample No. | Name | Date | Background Colonies counts/100 ml | Total Coliforms counts/100 ml | Faecal Coliforms counts/100 ml |
|---|---|---|---|---|---|
| 45 | J. Secord | July 21 | 334 | 3 | -- |
| | | Aug. 3 | 96 | 4 | <2 |
| 46 | W. Jameson | July 21 | 75 | 0 | 0 |
| 47 | R.Lombardi | Aug. 3 | 17 | 0 | 0 |
| 48 | A.Horobetz | July 21 | 75 | 0 | 0 |
| 49 | K.Lavalley | July 19 | 440,000 | 2,100 | -- |
| | | | 460,000 | 2,200 | -- |
| | | July 26 | 168,000 | 2,800 | 118 |
| | | | -- | 80+ | 74 |
| | Chlorine added | Aug. 3 | 3 | 2 | -- |
| 50 | Lavalley | See Sample No. 49 | | | |
| 51 | Unoccupied | July 26 | 560 | 70 | |

Table No. 2

BACTERIOLOGICAL RESULTS FROM SAMPLES TAKEN FROM RIVER

(See Map No. 1 for Sample Locations)

| Sample No. | Date | Background Colonies count/100 ml | Total Coliform count/100 ml | Faecal Coliform count/100 ml |
|---|---|---|---|---|
| 1 | July 21 | 14,500 | 2,900 | -- |
| 2 | July 26 | 560 | 70 | 2 |
| 3 | July 27 | 2,100 | 32 | 2 |
| 4. | July 27 | 448 | 64 | <2 |
| 5 | July 27 | 292 | 138 | <2 |

## BACTERIOLOGICAL EXAMINATION

TOTAL COLIFORM ORGANISMS include a wide variety of bacteria ranging from the genus (Group), Escherichia Coli, which originate mainly in the intestines of man and other warm-blooded animals, to the genera Citrobacter and Enterobacter aerogenes. The latter genera are basically found in soil but are also present in faeces in small numbers.

The presence of total coliforms in water may indicate soil runoff or more important, less recent faecal pollution since organisms of the Enterobacter - Citrobacter groups tend to survive longer in water than do members of the Eschericia Coli group, and even multiply when suitable environmental conditions exist.

The FAECAL COLIFORM ORGANISMS are those coliform bacteria which are all intestinal in origin and usually outnumber all other coliform types in human and animal intestines. Most of the coliform bacteria found by the faecal coliform test are of the genus Eschericia Coli. However, their death rate outside the warm body is high and accordingly if coliforms present in the water are primarily faecal coliforms, and their number is high, the pollution is probably nearby and recent. Smaller numbers with a high portion of faecal coliforms may indicate nearby pollution with counts reduced by dilution.

BACKGROUND COLONIES: The examination of a water sample for background colonies is a count of all the bacteria from all origins in a water sample. Most surface water contains some bacteria. The average count for a surface water is 1000 colonies per 100 ml, but the desirable count for domestic water supplies is none.

# APPENDIX NO. 2

Table No. 3

CHEMICAL ANALYSIS RESULTS

| Sample Location | Hardness mg/l | Alkalinity mg/l | Iron mg/l | Chloride mg/l | Phosphate mg/l | $p^H$ | Conductivity Micrombos/cm | Free Ammonia mg/l | Nitrite ,g/l | Nitrate mg/l |
|---|---|---|---|---|---|---|---|---|---|---|
| B. Rivard | 179 | 148 | 0.35 | 7 | .04 | 7.1 | 355 | <0.1 | <.01 | 3.4 |
| K.Lavalley | 98 | 98 | 3.80 | 21 | <.02 | 7.2 | 266 | 0.3 | <.01 | <0.1 |
| E.Lamonday | 156 | 166 | 0.15 | 30 | <.02 | 8.3 | 489 | 0.2 | <.01 | <0.1 |
| M.Smyth | 19 | 13 | 0.20 | 4 | <.02 | 8.0 | 56 | <0.1 | <.01 | <0.1 |
| S.Boucher | 58 | 37 | 2.40 | 17 | <.02 | 6.2 | 150 | <0.1 | <.01 | <0.1 |
| J.Doucette | 146 | 282 | 5.10 | 40 | .12 | 7.2 | 715 | 34.0 | .04 | .7 |
| River Sample 2 | 19 | 10 | 0.20 | 3 | <.02 | 6.8 | 46 | <0.1 | <.01 | <0.1 |
| River Sample 4 | 17 | 10 | 0.20 | 3 | <.02 | 7.9 | 52 | <0.1 | <.01 | <0.1 |
| M.O.E. Standards | -- | -- | 0.3 | 250 | .01 | 6.5-8.0 | -- | -- | -- | 10 |

Table No.4

PHENOL ANALYSIS RESULTS

| Well Water Samples | | River Water Samples | |
|---|---|---|---|
| Name | Phenols in p.p.b. | River Location see Map 2, Fig.I | Phenols in p.p.b. |
| J.Raiche | <1 | 1 | 8 |
| M.Smythe | 3 | 2 | 4 |
| R.Karwaski | <1 | 3 | 4 |
| N.Fletcher | 1 | 4 | 8 |
| A.Horobetz | 4 | 5 | 8 |
| K.Lavalley | 2 | 6 | 8 |
| B.Rivard | 4 | 7 | 8 |
| S.Boucher | 4 | 8 | 8 |
| | | 9 | 8 |
| | | 10 | 3 |
| | | 11 | 2 |

## CHEMICAL PARAMETERS

### HARDNESS

Hardness is applied to the soap-neutralizing power of water. It is generally attributed to the presence of calcium and magnesium ions. It may be caused by natural accumulations of salts from contact with the soil and geological formations. Although it poses no substantial health hazard, its presence in concentrations over 100 mg/l becomes increasingly inconvenient. Detrimental effects include increased soap consumption, the formation of scums and curds, the toughening of vegetables that have been cooked in hard water, and the formation of scales on boilers, hot water heaters, pipes and cooking utensils.

### ALKALINITY

Alkalinity is the measure of the power of water to neutralize hydrogen ions, and is measured in the terms of an equivalent amount of calcium carbonate.

Alkalinity is not considered to be detrimental to humans, but it is associated with high pH levels, hardness and excessive dissolved solids, all of which may be harmful.

The main component of alkalinity is the bicarbonate ion which may be formed by the action of carbon dioxide on limestone or other calcium deposits. When the pH becomes greater than 8.3, carbonate and hydroxide ions, as well as (to a lesser extent), borates, silicates, phosphates, and organic substances become components of alkalinity.

The alkalinity of water is generally used to assess the buffering capacity of the water's capability to resist a change in pH.

### IRON

Iron is generally found at low levels in most surface waters because of its relatively low solubility when the pH exceeds 7. It is an important component of haemoglobin and an essential element of all life forms. Iron is not toxic at high levels, but is objectionable in most drinking water supplies because of its colour and smell. It also leaves a reddish-brown pre-

cipitate on plumbing fixtures, kettles and laundry. The water quality objective for domestic water supplies is 0.3 mg/l.

CHLORIDES

Chlorides are found in practically all natural waters. They may be a result of natural mineral origin, or results of man-made actions such as salts spread on fields for agricultural reasons, salting roads, or industrial effluents from industries such as paper works, oil wells, and petroleum refineries.

pH

Natural water supplies have pH ranges from 5 to 8.5. The pH of the water is important in that it affects the taste, corrosivity, and efficiency of chlorination of water. The killing power of chlorine decreases with increasing pH values. Chlorination is most advantageous when the pH of the water supply is 7 or less.

The water quality criteria for domestic water supplies is 6.0 to 8.5.

CONDUCTIVITY

Conductivity is reported as specific electrical conductance, the reciprocal of the resistance, in ohms of a column or a solution once centimeter long with a cross-section of one cubic centimeter.

All water containing ionized substances will conduct an electrical current. The conductance of a water sample will indicate the presence of dissolved solids. The main contributors to conductivity in natural water are potassium, bicarbonate, chlorine, sulphate, and nitrate ions.

The indication of the presence of dissolved solids as given by the resultant conductivity correlates with the results received from the hardness and alkalinity analysis, inferring that there is a relatively high concentration of dissolved solids in the drinking water supply.

## NITROGEN

### NITRATES

Nitrates are the end product of aerobic stabilization of organic nitrogen. They occur in polluted waters that have undergone self-purification or aerobic treatment processes. Nitrates may originate from excessive doses of fertilizer, or leaching from sewage. Although they are considered non-toxic to adults, high levels in deomestic water supplies may result in infant methemoglobinemia, in which the oxygen carrying capacity of the blood is inhibited. The maximum acceptable level for domestic water supplies in Ontario is 10 mg/l if the water is to be used for infant feeding.

### NITRITES

Nitrites are formed by the action of bacteria upon ammonia and organic nitrogen. They are an intermediary step in the oxidation of ammonia. Nitrites are quickly oxidized to nitrates and are seldom present in high concentrations.

### FREE AMMONIA

Free ammonia or ammonia nitrogen results from the decomposition of nitrogenous organic matter. Although ammonia nitrogen is often the result of decaying vegetable matter, its concentration in water in excess of 0.10 mg/l renders the water suspect of recent pollution. Ammonia nitrogen is undesirable because it exerts a high oxygen demand when ozidizing to nitrite and nitrate. It also reacts with chlorine to form chloramines, thus reducing the effectiveness of the chlorination process.

Results from the analysis of nitrogen can be used to interpret the stage at which the biochemical reduction of nitrogenous matter is. A high ammonia nitrogen concentration indicates recent deposition of the nitrogenous matter in the near vicinity of where the sample was taken. High nitrite concentrations indicate that the decomposition process is well advanced. High nitrate concentrations signify the completion of the biochemical reduction of nitrogenous matter.

## PHOSPHATES

Phosphates are used in the manufacture of fertilizers and detergents, and may be observed in a water supply as a result of soil runoff and leaching. Artificial inputs of phosphorus may stimulate algae and aquatic plant growth, which increases the demand for oxygen, thus impairing water quality.

It is suggested that a concentration of 0.01 mg/l of inorganic phosphorus is sufficient to cause increased plant growth.

## PHENOLS

Phenol is a colourless crystalline substance with a characteristic odour. It is commercially obtained from coal and tar. Phenolitic wastes may be a result of the decomposition of wood, and human and animal wastes.

The consumption of phenols in concentrated solutions will result in severe pain, renal irritation, shock, and possibly death. It is not likely, however, that high concentrations will be consumed, as such concentrations are much higher than taste considerations will allow. Strong medicinal odours may occur when the phenol concentrations reach 0.002 mg/l (2 ppb) , yet concentrations of up to 0.05 mg/l (50 ppb) have been observed to have no odour.

Chlorinating a water supply that contains phenols causes chlorophenols to be formed. These chlorophenols may be responsible for taste and odour problems.

APPENDIX NO. 3

Ontario

Ministry of the Environment

Municipal and Private Abatement
Northeastern Region
74 Church Street, Parry Sound, Ontario,P2A 1Z1
(705) 746-2139

Dear Sir:

A recent sample of your drinking water was taken by our office and analyzed to determine its safety for consumption. The results of the bacterial count in your water are listed at the end of this letter.

Since coliforms are the main group of bacteria that signify polluted water, your bacteria count should read 0/0. Only the COMPLETE ABSENCE of these bacteria indicates safe drinking water.

Should your bacteria count not read 0/0, please see the enclosed suggestions for producing safe water. Untreated water sources should be sampled four times a year (January, April, July, and October). If you have any further questions, please feel free to contact me. Your co-operation in this matter will be greatly appreciated.

Yours truly

:ws
Encl:

Environmental Officer

RESULTS FROM BACTERIOLOGICAL SAMPLE

| Date | Background Colonies | Total Coliform | Faecal Coliform |
|---|---|---|---|
| | | | |

## PRODUCING SAFE WELL WATER

Apply a chlorinated laundry bleach in sufficient quantity to disinfect the entire volume of water in the well. The amount of chlorine bleach may be calculated from the following table, knowing the diameter of the well and the depth of the water.

| Diameter of Well Casing In Inches | Chlorine Bleach/10 ft. Depth of Water: one to ten Coliforms | More than 10 Coliforms |
|---|---|---|
| 4 | .5 oz | 1 oz |
| 6 | 1 oz | 2 oz |
| 8 | 2 oz | 4 oz |
| 12 | 4 oz | 8 oz |
| 16 | 7 oz | 14 oz |
| 20 | 11 oz | 22 oz |
| 24 | 16 oz | 31 oz |
| 30 | 25 oz | 49 oz |
| 36 | 35 oz | 70 oz |

Another sample should be analyzed after one week of chlorinating your well to ensure that you are doing so safely and correctly. Please contact this office when you would like another water sample taken.

It is important to realize that your water source should be inspected for access routes of polluting materials (eg surface soil, run-off following rain, deteriorated well casings, etc). These access routes should be permanently removed. Atempts at disinfecting the water source without inspecting and removing the access routes of contamination may not supply bacteriologically safe water on a continuing basis.

## DISINFECTING DRINKING WATER

## FROM A LAKE, STREAM OR SPRING

The following two suggestions will help you:

1. Boil your drinking water for a minimum of five (5) minutes before drinking

and/or

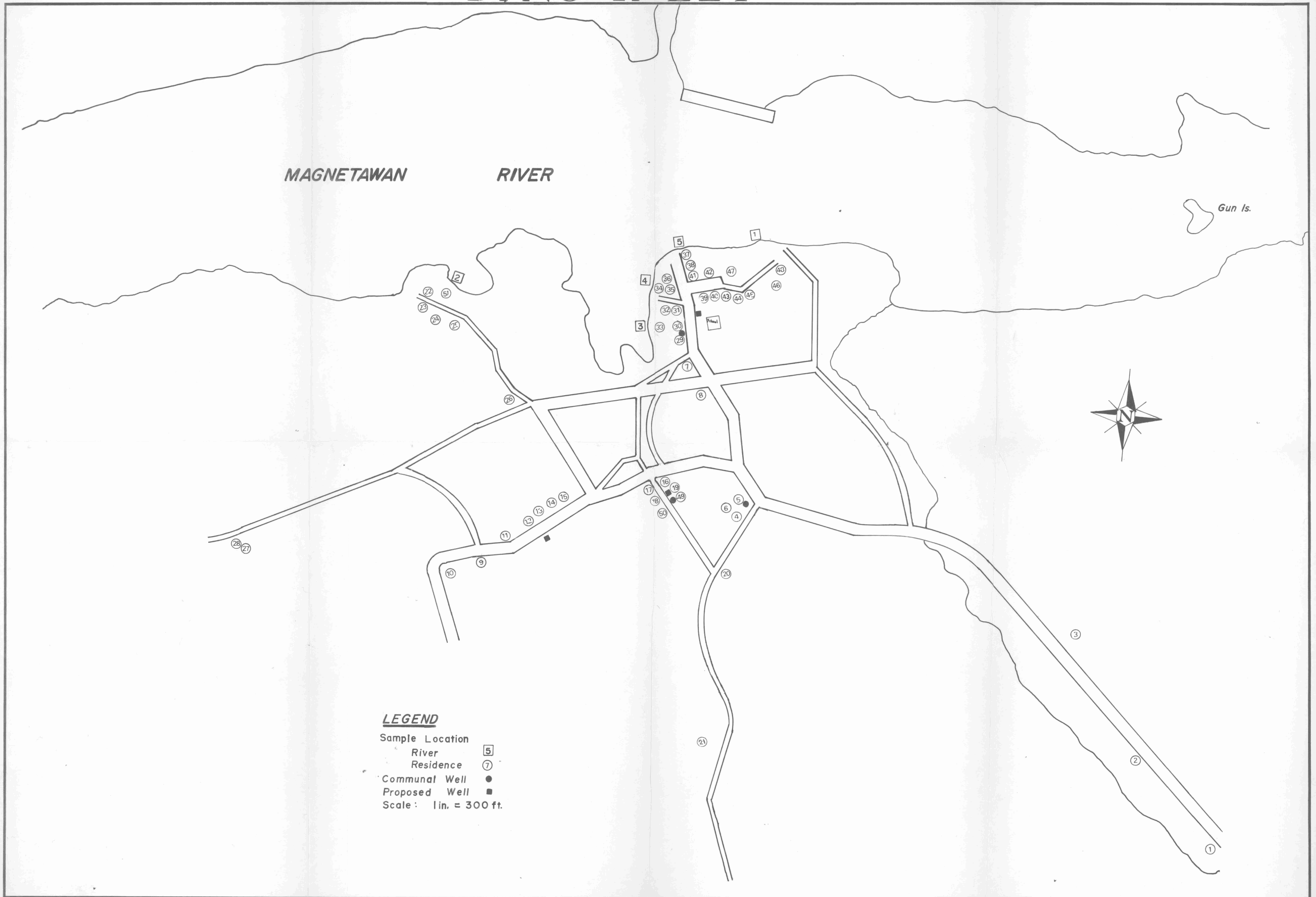
2. Chemically disinfect your drinking water by adding eight (8) drops of a chlorinated laundry bleach to one (1) gallon of water and let stand fifteen (15) minutes before drinking.

Another sample should be analyzed after one week from chlorinating your well to ensure that you are doing so safely and correctly. Please contact this office when you would like another sample taken.

It is important to realize that your water source should be inspected for access routes of polluting materials (eg: surface soil, run-off following rain, deteriorated well casings, etc.). These access routes should be permanently removed. Attempts at disinfecting the water source without inspecting and removing the access routes of contamination may not supply bacteriologically safe water on a continuing basis.

APPENDIX NO. 4

# BYNG INLET




Ministry of the Environment    Sanitary Survey    August 1977    Jim Dyment